Electrochemical Capacitive Behaviour of Carbon based and /or NT-CoFe$_2$O$_4$ Nanocomposites

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Cobalt ferrite nanoparticles CoFe2O4 and their carbon based and /or NT nanocomposites : CoFe2O4-CoC03, CoFe2O4-CoC03/NT have been successfully synthesized by a simple one step hydrothermal method, using NaOH, and urea surfactants. The X-ray diffraction confirms the presence of cobalt ferrite and cobalt ferrite-carbonate phases, the SEM and TEM analyzes reveals the nanosized particles. The electrochemical performances of these products were investigated by cyclic voltammetry, charge–discharge and electrochemical impedance spectroscopy in 6M KOH aqueous electrolyte, in a three-electrode system. A maximum specific capacitances (capacities) of 246 F.g$^{-1}$ (27 mAh.g$^{-1}$), 285 F.g$^{-1}$ (31 mAh.g$^{-1}$) and 277 F.g$^{-1}$ (30 mAh.g$^{-1}$) were obtained respectively for CoFe2O4, CoFe2O4-CoC03 and CoFe2O4-CoC03/NT at a current density of 0,5 A/g. The Cobalt ferrite-carbonate shows an excellent capacitance retention of 97,8% after 1000 cycles at a current density of 5A/g.

Recent Publications

Biography
Dr. Aicha Harat is a teacher-researcher and head of a team research on LE-REC laboratory (University of Annaba, Algeria). Her principal research topic is magnetic and high Tc superconducting materials. Now she deals with magnetic nanoparticles and their carbon based nanocomposites synthesized by various methods (co-precipitation, hydrothermal, combustion...) and their application in supercapacitors for energy storage. (orcid.org/0000-0002-1748-9290 )

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